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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Art Unit: 2121

Examiner: C. J. Barnes

Applicant(s): Dimitar P. Filev et al.

Serial No.: 09/552,710

Filing Date: April 19, 2000

For: PORTABLE ADVISORY SYSTEM FOR BALANCING AIRFLOWS IN PAINT BOOTH

**APPEAL BRIEF**



Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

By Notice of Appeal filed June 25, 2003, Applicants have appealed the Final Rejection dated February 25, 2003 and submit this brief in support of that appeal.

## REAL PARTY IN INTEREST

The real party in interest is the Assignee, Ford Global Technologies, Inc.

## RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences regarding the present application.

## STATUS OF CLAIMS

Claims 1 through 12 have been rejected.

Claims 1 through 12 are being appealed.

## STATUS OF AMENDMENTS

An Amendment Under 37 C.F.R. 1.116 was filed on May 27, 2003 in response to the Final Office Action dated February 25, 2003. An Advisory Action dated June 16, 2003 indicated that the Amendment under 37 C.F.R. 1.116 had been considered, but would not place the application in a condition for allowance. The Advisory Action does not indicate that the Amendment under 37 C.F.R. 1.116 would be entered upon filing an appeal. A Notice of Appeal and a Request for a One Month Extension of Time, along with the requisite fees, were filed on June 25, 2003. The Appeal Brief, along with the requisite fee, is submitted herewith.

## SUMMARY OF THE INVENTION

The present invention is a portable advisory system 60 for use with a paint booth 10. The portable advisory system 60 includes an airflow sensor 62 and a main computer unit 64, both of which are portable. The airflow sensor 62 is portable and has a serial communication interface for communicating with the main computer unit 64. The airflow sensor 62 is of a handheld acoustic anemometer type. The airflow sensor 62 measures the cross and down velocities and communicates the measured data with the main computer unit 64.

The main computer unit 64 is a portable computer unit such as a laptop or palmtop computer. The main computer unit 64 has a memory, a processor, a display and a user input mechanism, such as a mouse or keyboard. The main computer unit 64 contains a first database (DB1) 66 of information such as last optimal commands and last optimal sensitivity model. The main computer unit 64 contains a second database (DB2) 68 of information such as air velocities

and VFD/damper commands. The main computer unit 64 also contains an algorithm 70 of a method, according to the present invention to be described, of balancing airflows in the paint booth 10. The algorithm 70 includes a learning instantaneous sensitivity model (J) and on-line optimization. The algorithm 70 communicates with the first and second databases 66 and 68. The main computer unit 64 further includes a flexible set-up dialog 72 that communicates with the algorithm 70.

In operation, the portable airflow sensor 62 measures air velocities in the zones of the paint booth 10. After measuring all air velocities that are subject of adjustment, the portable airflow sensor 62 transmits the cross and down velocity data to the second database 68. The measured air velocities and the VFD's/Damper data that are associated with these measured values are passed to the algorithm 70.

The algorithm 70 updates a sensitivity model (J) of the paint booth 10. The sensitivity model (J) contains estimates of the matrix of the first partial derivatives of the velocities with respect to the VFD's/Dampers (input-output Jacobian). The Widrow-Hoff rule is used for leaning the Jacobian matrix rather than directly calculating the partial derivatives in order to eliminate the effect of noise. The flexible set-up dialog 72 includes user-friendly software that configures the portable advisory system 60 so it can be used in different paint booths 10. The first database 66 contains the last update of the sensitivity model (J) and last optimal VFD's and dampers' settings. The second database 68 contains the current VFD's and dampers' settings and the corresponding cross/down velocities.

After completing each set of velocity measurements, the algorithm 70 calculates a mean squared error (MSE) between the output velocity vector y and the vector of targets $y_d$. If the MSE is nonzero and a gradient of change of the input vector u exceeds a threshold constant,

the sensitivity model (J) of the paint booth 10 is updated by using the Widrow-Hoff rule. In the algorithm 70 of the present invention, the rate $\rho$ is dynamically determined by the gradient of the MSE between the output vector y and the target vector $y_d$. If the MSE systematically decreases, which is an indication for a robust optimization process, the rate $\rho$ is decreased vice versa. Feasibility of the new input vector update u is checked by comparing with lower and upper limits and the elements that exceed the limits are replaced by the particular limits themselves. The new input values are placed in the second database 68 and displayed. These updated output values are manually applied as new VFD/damper settings. These new input values are used in the next adjustment of the inputs. The new inputs and the current sensitivity model (J) are stored in the first database 66 for further use. The purpose of the first database 66 is to save the last optimal input settings and the last sensitivity model (J) for a particular paint booth 10 so they can be used as initial conditions for starting the algorithm 70 every time a new balancing procedure starts.

In the present invention, the method starts in box 100 with the input vector u(k) and output vector y(k). The method advances to block 102 and calculates the sum-squared error (e), between the current outputs and their targets. The method then advances to block 104 and calculates the norm (N) of the change in the measure of the control signal ($\Delta u$). The method advances to diamond 106 and determines whether the norm (N) of $\Delta u$ is greater than a predetermined parameter ($\epsilon$). If not, the method advances to block 108 and sets a change of control $\Delta u$ equal to a zero value. The method then advances to block 110 and calculates the new input vector (u) according to equation (4). In this case, no change of control is made.

In diamond 106, if the norm of $\Delta u$ is greater than $\epsilon$, the method advances to block 112 and calculates the rate of learning ($\alpha$) according to equation (2). The method advances to diamond 114 and determines whether the change in error ($\Delta e$) is systematically less than or equal

to zero. If so, the method advances to block 116 and increments parameter ρ. The method then advances to block 118 and calculates the change in the input signal according to equation (3). The method advances to block 110 previously described.

In diamond 114, if the change in error (Δe) is not systematically less than or equal to zero, the method advances to diamond 120 and determines whether the last change in error is greater than a zero value. If not, the method advances to block 118 previously described. If so, the method advances to block 122 and calculates parameter ρ. The method then advances to block 118 previously described.

## ISSUE

The issues in this Appeal are statutorily formulated in 35 U.S.C. § 103. Specifically, one issue is whether the claimed invention of claims 1, 4, 5, 8, and 10 through 12 are obvious and unpatentable under 35 U.S.C. § 103 over Tong et al. (U.S. Patent No. 6,226,568). Another issue is whether the claimed invention of claims 1 through 3, 8, and 9 are obvious and unpatentable under 35 U.S.C. § 103 over Tong et al. (U.S. Patent No. 6,146,264). Yet another issue is whether the claimed invention of claims 6 and 7 are obvious and unpatentable under 35 U.S.C. § 103 over Tong et al. '264 and further in view of Rein et al. '988. Still another issue is whether the claimed invention of claim 1 is obvious and unpatentable under 35 U.S.C. § 103 over Ayer (U.S. Patent No. 5,643,077).

## GROUPINGS OF CLAIMS

Claims 1 through 7 stand or fall together in regard to the rejections under 35 U.S.C. § 103.

Claims 8 through 12 stand or fall together in regard to the rejections under 35 U.S.C. § 103.

## ARGUMENT

As to patentability, 35 U.S.C. § 103 provides that a patent may not be obtained:

> If the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Id.

The United States Supreme Court interpreted the standard for 35 U.S.C. § 103 in Graham v. John Deere, 383 U.S. 1, 148 U.S.P.Q. 459 (1966). In Graham, the Court stated that under 35 U.S.C. § 103:

> The scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined. 148 U.S.P.Q. at 467.

Using the standard set forth in Graham, the scope and content of the prior art relied upon by the Examiner will be determined.

U.S. Patent No. 6,226,568 to Tong et al. discloses a method of balancing paint booth air flows. Low air flows sensors 52 may be used adjacent each cross-flow damper 50, the sensor providing accuracy in signaling air flow direction and air flow velocity. Digital output of the sensors is sent to a microprocessor 53 which in turn converts the information for use by a programmable logic controller that adjusts the cross-flow dampers and venturi gap width. An

operator interface with the controller can be attained through use of a desktop terminal personal computer 55 or through a remote terminal unit.

U.S. Patent No. 6,146,264 to Tong et al. discloses a paint booth air flow control system. Fans and dampers are controlled by flow velocity sensors 60 located at partitions 26. A computer 88 includes a co-processor 76 containing an algorithm that is designed to drive the fans and dampers toward a desired operating mode represented by arrows 52. The computer 88 further includes a programmable logic controller 78 that receives signals from the sensors 60 and delivers control signals to fan motors and damper motors.

U.S. Patent No. 5,643,077 to Ayer discloses a continually optimize, variable flow rate ventilation system. A monitor 19 measures concentrations in a recirculation duct 16 upstream of where a fresh make-up air 17 is introduced and continuously analyzes the concentration in a recirculation stream 20. The output from the monitor 19 is sent to a central computer 22 via electrical interface, fiber optic cable, or equivalent 21. The central computer 22 controls the recirculation flow rate via a fresh make-up air intake damper 23 and a recirculation damper 24.

In contradistinction, claim 1 claims the invention as a portable advisory system (60) for balancing airflows in a paint booth (10) including a portable airflow sensor (62) to measure airflows in the paint booth (10). The portable advisory system (60) also includes a portable computer (64) connected to the airflow sensor (62) for collecting data from the airflow sensor (62) and guiding an operator through a process of adjusting multiple fan speeds and duct dampers to achieve desired airflows.

The United States Court of Appeals for the Federal Circuit (CAFC) has stated in determining the propriety of a rejection under 35 U.S.C. § 103(a), it is well settled that the

obviousness of an invention cannot be established by combining the teachings of the prior art absent some teaching, suggestion or incentive supporting the combination. See In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1985); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 U.S.P.Q. 929 (Fed. Cir. 1984). The law followed by our court of review and the Board of Patent Appeals and Interferences is that " [a] prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art." In re Rinehart, 531 F.2d 1048, 1051, 189 U.S.P.Q. 143, 147 (C.C.P.A. 1976). See also In re Lalu, 747 F.2d 703, 705, 223 U.S.P.Q. 1257, 1258 (Fed. Cir. 1984) ("In determining whether a case of prima facie obviousness exists, it is necessary to ascertain whether the prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making the claimed substitution or other modification.")

As to the differences between Tong et al. '568 and the claims at issue, the primary reference to Tong et al. '568 merely discloses a method of balancing paint booth air flows in which a digital output of air flows sensors is sent to a microprocessor which converts the information for use by a programmable logic controller with an operator interface through use of a desktop terminal personal computer or through a remote terminal unit. Tong et al. '568 lacks a portable airflow sensor to measure airflows in the paint booth and a portable computer connected to the airflow sensor for collecting data from the airflow sensor. In Tong et al. '568, the air flow sensors 52 are permanently mounted and not portable. In addition, Tong et al. '568 uses on-line control via a desktop computer 55, which is not a portable computer. There is no suggestion or motivation in the art for modifying Tong et al. '568.

There is absolutely no teaching of a level of skill in the paint booth art that a portable advisory system for balancing air flows in a paint booth includes a portable airflow sensor to measure airflows in the paint booth and a portable computer connected to the airflow sensor for collecting data from the airflow sensor. The Examiner admits on page 4 of the Office Action that Tong et al. '568 does not expressly disclose a portable airflow sensor and a portable computer. However, without a factual basis, the Examiner determines that the sensors and computer of Tong et al. '568 could be made portable. The Examiner may not, because he/she doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See In re Warner, 379 F. 2d 1011, 154 U.S.P.Q. 173 (C.C.P.A. 1967).

As to the differences between Tong et al. '264 and the claims at issue, Tong et al. '264 merely discloses a paint booth air flow control system in which a computer includes a programmable logic controller that receives signals from flow velocity sensors and delivers control signals to fan motors and damper motors. Tong et al. '264 lacks a portable airflow sensor to measure airflows in the paint booth and a portable computer connected to the airflow sensor for collecting data from the airflow sensor. In Tong et al. '264, the sensors 60 are permanently mounted and not portable. Also, Tong et al. '264 uses on-line control via the co-processor 76, which is not a portable computer. There is no suggestion or motivation in the art for modifying Tong et al. '264.

While Tong et al. '264 discloses a paint booth air flow control system, it does not teach or suggest that the airflow sensor is portable to measure airflows in the paint booth and that the computer is portable for collecting data from the airflow sensor. The Examiner admits on page 4 of the Office Action that Tong et al. '264 does not expressly disclose a portable airflow

sensor and a portable computer. However, without a factual basis, the Examiner determines that the sensors and computer of Tong et al. '264 could be made portable. Thus, the reference fails to teach a level of skill in the art of paint booths that a portable advisory system can be provided for balancing air flows in a paint booth to include a portable airflow sensor to measure airflows in the paint booth and a portable computer connected to the airflow sensor for collecting data from the airflow sensor.

As to the differences between Ayer '077 and the claims at issue, Ayer '077 merely discloses a continually optimize, variable flow rate ventilation system in which a monitor measures concentrations in a recirculation duct and the output from the monitor is sent to a central computer via electrical interface, fiber optic cable, or equivalent, which controls the recirculation flow rate via dampers. Ayer '077 lacks a portable airflow sensor to measure airflows in the paint booth and a portable computer connected to the airflow sensor for collecting data from the airflow sensor. Ayer '077 uses on-line control via a central computer 22, which is not a portable computer. There is no suggestion or motivation in the art for modifying Ayer '077.

There is absolutely no teaching of a level of skill in the paint booth art that a portable advisory system for balancing air flows in a paint booth includes a portable airflow sensor to measure airflows in the paint booth and a portable computer connected to the airflow sensor for collecting data from the airflow sensor. The Examiner admits on page 4 of the Office Action that Ayer '077 does not expressly disclose a portable airflow sensor and a portable computer. However, without a factual basis, the Examiner determines that the sensors and computer of Ayer '077 could be made portable. The Examiner may not, because he/she doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight

reconstruction to supply deficiencies in the factual basis. See In re Warner, 379 F. 2d 1011, 154 U.S.P.Q. 173 (C.C.P.A. 1967).

Each of the references, if modifiable, fails to teach or suggest the combination of a portable advisory system for balancing airflows in a paint booth including a portable airflow sensor to measure airflows in the paint booth and a portable computer connected to the airflow sensor for collecting data from the airflow sensor and guiding an operator through a process of adjusting multiple fan speeds and duct dampers to achieve desired airflows as claimed by Applicants. The Examiner has failed to establish a case of prima facie obviousness.

The present invention sets forth a unique and non-obvious combination of a portable advisory system for balancing air flows in a paint booth including a portable airflow sensor to measure airflows in the paint booth and a portable computer connected to the airflow sensor for collecting data from the airflow sensor. Advantageously, the portable advisory system uses a handheld acoustic anemometer or airflow sensor to measure airflows in a paint booth that are output to a laptop/palmtop computer that collects data and guides the operator through the process of adjusting multiple fan speeds and duct dampers to achieve the desired airflows in the paint booth in a relatively short time interval without adding costly automation equipment.

Obviousness under § 103(a) is a legal conclusion based on factual evidence (In re Fine, 837 F.2d 1071, 1073, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988)), and the subjective opinion of the Examiner as to what is or is not obvious, without evidence in support thereof, does not suffice. Because the Examiner has not provided a sufficient factual basis that is supportive of his/her position (see In re Warner, 379 F.2d 1011, 1017, 154 U.S.P.Q. 173, 178 (C.C.P.A. 1967), cert. denied, 389 U.S. 1057 (1968)), the rejections of claim 1 are improper.

Against this background, it is submitted that the present invention of claim 1 is not obvious in view of either Tong et al. '568, Tong et al. '264, or Ayer '077. The references fail to teach or suggest the combination of a portable advisory system for balancing airflows in a paint booth of claim 1. Therefore, it is respectfully submitted that claim 1 is not obvious and is allowable over the rejections under 35 U.S.C. § 103.

The law is clear that a claim in dependent form shall be construed to incorporate by reference all of the limitations of the claim to which it refers. 35 U.S.C. § 112, ¶ 4. Dependent claims 2 through 7 perfect and further limit independent claim 1. Claim 2 defines that the computer includes a database of optimal control settings for storing information of last optimal commands and last optimal sensitivity model. Claim 3 defines that the computer includes a database for storing information of air velocities and VFD/damper commands. Claim 4 defines that the computer is a laptop computer. Claim 5 defines that the computer is a palmtop computer. Claim 6 defines that the computer includes a flexible set-up dialog. Claim 7 defines that the computer includes an algorithm communicating with a plurality of databases and a flexible set-up dialog. Based on the above, it is respectfully submitted that claims 2 through 7 are not obvious and are allowable over the rejection under 35 U.S.C. § 103.

As to independent claim 8, claim 8 claims the invention as a method of balancing airflows in a paint booth (10). The method includes the steps of providing a portable airflow sensor (62) to measure airflows in the paint booth (10) and providing a portable computer (64) and connecting the portable computer (64) to the air flow sensor (62). The method also includes the steps of measuring the velocity of the airflows in the paint booth (10) with the airflow sensor (62) and storing the measured airflows in a database and updating a sensitivity model (J) of the paint booth (10) with the measured velocity of the airflows to balance the airflows in the paint

booth (10).

None of the references cited, either alone or modified, teach or suggest the claimed invention of claim 8. As to the differences between Tong et al. '568 and the claims at issue, Tong et al. '568 merely discloses a method of balancing paint booth air flows in which a digital output of air flows sensors is sent to a microprocessor which converts the information for use by a programmable logic controller with an operator interface through use of a desktop terminal personal computer or through a remote terminal unit. Tong et al. '568 lacks providing a portable airflow sensor to measure airflows in the paint booth and providing a portable computer and connecting the portable computer to the airflow sensor. Tong et al. '568 also lacks measuring the velocity of the airflows in the paint booth with the airflow sensor and storing the measured airflows in a database and updating a sensitivity model (J) of the paint booth with the measured velocity of the airflows to balance the airflows in the paint booth. In Tong et al. '568, the air flow sensors 52 are permanently mounted and not portable. In addition, Tong et al. '568 uses on-line control via a desktop computer 55, which is not a portable computer.

Even if Tong et al. '568 could be modified, it does not teach providing a portable airflow sensor to measure airflows in the paint booth, providing a portable computer and connecting the portable computer to the airflow sensor, and updating a sensitivity model (J) of the paint booth with the measured velocity of the airflows to balance the airflows in the paint booth. The Examiner admits on page 4 of the Office Action that Tong et al. '568 does not expressly disclose a portable airflow sensor and a portable computer. There is no suggestion or motivation in the art for modifying Tong et al. '568.

As to the differences between Tong et al. '264 and the claims at issue, Tong et al. '264 merely discloses a paint booth air flow control system in which a computer includes a

programmable logic controller that receives signals from flow velocity sensors and delivers control signals to fan motors and damper motors. Tong et al. '264 lacks providing a portable airflow sensor to measure airflows in the paint booth and providing a portable computer and connecting the portable computer to the airflow sensor. Tong et al. '264 also lacks measuring the velocity of the airflows in the paint booth with the airflow sensor and storing the measured airflows in a database and updating a sensitivity model (J) of the paint booth with the measured velocity of the airflows to balance the airflows in the paint booth. In Tong et al. '264, the sensors 60 are permanently mounted and not portable. Also, Tong et al. '264 uses on-line control via the co-processor 76, which is not a portable computer. There is no suggestion or motivation in the art for modifying Tong et al. '264.

There is absolutely no teaching of a level of skill in the paint booth art that a method of balancing air flows in a paint booth includes providing a portable airflow sensor to measure airflows in the paint booth and providing a portable computer connected to the airflow sensor for collecting data from the airflow sensor. The Examiner admits on page 4 of the Office Action that Tong et al. '264 does not expressly disclose a portable airflow sensor and a portable computer. However, without a factual basis, the Examiner determines that the sensors and computer of Tong et al. '264 could be made portable. The Examiner may not, because he/she doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See In re Warner, 379 F. 2d 1011, 154 U.S.P.Q. 173 (C.C.P.A. 1967).

The present invention sets forth a unique and non-obvious combination of a method of balancing airflows in a paint booth including the steps of providing a portable airflow sensor to measure airflows in the paint booth, providing a portable computer, connecting the

portable computer to the air flow sensor, measuring the velocity of the airflows in the paint booth with the airflow sensor, storing the measured airflows in a database, updating a sensitivity model (J) of the paint booth with the measured velocity of the airflows to balance the airflows in the paint booth. Advantageously, the method automatically updates a simplified model of the airflows in a paint booth and uses this model to iteratively calculate the optimum adjustments to the fan speed and/or duct damper settings by minimizing the mean squared error between current and target airflows.

Each of the references, if modifiable, fails to teach or suggest the combination of a method of balancing airflows in a paint booth including the steps of providing a portable airflow sensor to measure airflows in the paint booth, providing a portable computer, connecting the portable computer to the air flow sensor, measuring the velocity of the airflows in the paint booth with the airflow sensor, storing the measured airflows in a database, updating a sensitivity model (J) of the paint booth with the measured velocity of the airflows to balance the airflows in the paint booth as claimed by Applicants.

Further, the CAFC has held that "[t]he mere fact that prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification". In re Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). The Examiner has failed to show how the prior art suggested the desirability of modification to achieve Applicants' invention. The Examiner has failed to establish a case of prima facie obviousness.

Against this background, it is submitted that the present invention of claim 8 is not obvious in view of either Tong et al. '568 or Tong et al. '264. Each of the references fails to teach or suggest the combination of a method of balancing airflows in a paint booth of claim 8.

Therefore, it is respectfully submitted that claim 8 is not obvious and is allowable over the rejection under 35 U.S.C. § 103.

Dependent claims 9 through 12 perfect and further limit independent claim 8. Claim 9 defines that the method includes the step of updating on-line the VFD and damper settings. Claim 10 defines that the step of updating includes computing a mean squared error with the sensitivity model (J). Claim 11 defines that the method includes the step of updating new inputs and current sensitivity model in a first database. Claim 12 defines that the method includes the step of calculating a rate of learning. Based on this, it is respectfully submitted that claims 9 through 12 are not obvious and are allowable over the rejection under 35 U.S.C. § 103.

In conclusion, it is respectfully submitted that the rejection of claims 1 through 12 is improper and should be reversed.

Respectfully submitted,

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## APPENDIX

The claims on appeal are as follows:

1. A portable advisory system for balancing airflows in a paint booth comprising:

a portable airflow sensor to measure airflows in the paint booth; and

a portable computer connected to said airflow sensor for collecting data from said airflow sensor and guiding an operator through a process of adjusting multiple fan speeds and duct dampers to achieve desired airflows.

2. A portable advisory system as set forth in claim 1 wherein said computer includes a database of optimal control settings for storing information of last optimal commands and last optimal sensitivity model.

3. A portable advisory system as set forth in claim 1 wherein said computer includes a database for storing information of air velocities and VFD/damper commands.

4. A portable advisory system as set forth in claim 1 wherein said computer is a laptop computer.

5. A portable advisory system as set forth in claim 1 wherein said computer is a palmtop computer.

6. A portable advisory system as set forth in claim 1 wherein said computer includes a flexible set-up dialog.

7. A portable advisory system as set forth in claim 1 wherein said computer includes an algorithm communicating with a plurality of databases and a flexible set-up dialog.

8. A method of balancing airflows in a paint booth, said method comprising the steps of:

providing a portable airflow sensor to measure airflows in the paint booth;

providing a portable computer and connecting the portable computer to the air flow sensor;

measuring the velocity of the airflows in the paint booth with the airflow sensor and storing the measured airflows in a database; and

updating a sensitivity model (J) of the paint booth with the measured velocity of the airflows to balance the airflows in the paint booth.

9. A method as set forth in claim 8 including the step of updating on-line the VFD and damper settings.

10. A method as set forth in claim 8 wherein said step of updating includes computing a mean squared error with the sensitivity model (J).

11. A method as set forth in claim 8 including the step of updating new inputs and current sensitivity model in a first database.

12. A method as set forth in claim 8 including the step of calculating a rate of learning.